39. (New)   The computer program product of claim 27, wherein instructions for instructing the cable modem to adjust its power comprises instructions for sending instructions from the headend to the cable modem.

40. (New)   The computer program product of claim 32, wherein the program instructions further comprise instructions for sending instructions from the headend to the cable modem to adjust the cable modem power by amount determined using the second technique.

41. (New)   Apparatus for adjusting the power of a cable modem on a cable network, the apparatus comprising:

(a)   means for determining that cable modem signals received at or proximate a head-end of the cable network fluctuate in power by more than a defined amount;

(b)   means for calculating a power adjustment using a plurality of recent power measurements of signals from the cable modem taken at or proximate the head-end of the cable network; and

(c)   means for instructing the cable modem to adjust its power based upon the calculated power adjustment.

42. (New)   Apparatus for controlling the power at which a cable modem sends data upstream on a cable network, wherein at or proximate a cable network head-end, the cable network periodically determines the power of upstream signals from the cable modem, the apparatus comprising:

(a)   means for adjusting the cable modem power based on a first technique;

(b)   means for determining that upstream signals from the cable modem contain more than a threshold level of noise or fluctuation; and

(c)   means for adjusting the cable modem power based upon a second technique that averages recent cable modem power measurements.

REMARKS

Claims 1-42 are pending in the application. Claims 15 and 35 have been amended. Claims 36-42 have been added. Favorable reconsideration of the application, as amended, is respectfully requested.

I. OBJECTION TO THE DRAWINGS

The drawings stand objected to because the reference numeral 110, which is mentioned in the specification, does not appear in Figure 1. The specification has been amended to remove the reference numeral 110 at page 2, line 15. Such an amendment is believed to be consistent with Figure 1, and the rest of the specification. No new matter has been introduced by this amendment. Withdrawal of the objection is respectfully requested.

II. OBJECTIONS TO THE CLAIMS

Claims 15 and 35 stand objected to because of informalities. These claims have been amended to remove the term "now," and recite a relative timing at which returning to the first technique occurs, i.e., "after instructing the cable modem to adjust its power." Support for this amendment is found at, for example, page 6, lines 33-35; and page 14, lines 4-14. No new matter has been introduced by this amendment. Withdrawal of the objections is respectfully requested.

Claims 15 and 35 have been amended to be consistent with the corresponding independent claims 11 and 32, respectively.

III. REJECTIONS OF CLAIMS 1-35 UNDER 35 U.S.C. § 103

Claims 1-35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,453,472 ("Leano") in view of U.S. Patent No. 6,212,399 ("Kumar"). All pending claims are believed to be allowable for at least the following reasons. Withdrawal of the rejection is respectfully requested.

The present invention defined in independent claims 1, 11, 16, 24, 27, and 32 relates to methods, cable modem termination systems, and computer program products which adjust a power or frequency used by a cable modem. Independent claims 1 and 27 require (a) "determining that cable modem signals ... fluctuate in power ... ," and (b) "calculating a power adjustment using a plurality of recent power measurements ... ." Independent claims 11 and 32 require "determining that upstream signals ... contain more than a threshold level of noise or fluctuation ... ," and "adjusting the cable modem power [using a] technique that averages recent cable modem power measurements."

Independent claim 24 requires "calculating a frequency adjustment using a plurality of recent frequency measurements ... ." Independent claim 16 requires a "cable modem termination system" which "calculat[es] a single power level adjustment ... based upon a plurality of the detected power levels," and "generat[es] instructions to the cable modem to make the calculated power adjustment."

As the Examiner conceded in the Office Action, Leano does not teach adjustment based on a plurality of recent power measurements. Kumar was cited to make up this deficiency of Leano in rejecting all pending claims. However, it is respectfully submitted that Kumar also fails to teach or suggest this claimed feature as discussed below.

The Kumar patent describes a system in which a wireless terminal 502 receives and analyzes a power control signal b_i (sent by a base station) in order to control its power level. The Kumar system uses a dispersion D which is derived from a plurality of the power control signals b_i (column 6, lines 37-60). Possibly, the Examiner views calculation of this dispersion as meeting the claim limitation requiring "a power adjustment using a plurality of recent power measurements." However, the power control signals of Kumar do not represent "power measurements" as claimed. The Kumar power control signals b_i represent either "+1" or "-1," which is a command from the base station 501 to the wireless terminal 502 in order to increase or decrease, respectively, transmit power level (column 5, lines 33-37). In order to determine by how much the wireless terminal should adjust its power, it calculates a dispersion or other parameter based on multiple power control signals.

The power control signals of Kumar are neither power measurements nor derivatives of power measurements. A power control signal b_i is determined by comparing a signal quality with a target quality (i.e., an SIR target) (column 5, lines 53-59). Such a signal quality mentioned in Kumar corresponds more closely to a signal-to-noise ratio, than to a power level. As such, Kumar's power control signals b_i do not remotely correspond to the claimed power measurements. Therefore, Kumar fails to teach or suggest a calculation based on a plurality of recent power measurements as claimed, and thus, fails to cure the deficiencies of Leano. It is respectfully submitted that all pending claims are patentable over Leano and Kumar at least in this regard.

Regarding claim 24, none of Leano and Kumar teach or suggest "a frequency adjustment using a plurality of recent frequency measurements." Applicants respectfully submit that Kumar's power control signals do not correspond to the "frequency measurements" of claim 24. Thus, the invention of claim 24 is not obvious from the cited art.

In addition to the reasons set forth above, claim 16 is patentable over the cited references for the following reasons. Claim 16 requires "(b) means for calculating a single power level adjustment for the cable modem based upon a plurality of the detected power levels," and "(c) means for generating instructions to the cable modem to make the calculated power adjustment." None of Leano and Kumar teach or suggest these claimed features. The Examiner acknowledges that Leano fails to teach the above feature (b), i.e., calculation of adjustment based on "a plurality of the detected powr levels."

Kumar fails to teach the feature (b) in claim 16 because Kumar's dispersion D is calculated based on control signals, not "detected power levels" as claimed, as discussed in detail above. Kumar does not teach the feature (c) because, in Kumar's system, the wireless terminal 502, not the base station 501, receives the power control signals b_i, and uses them to control the transmission power of the wireless terminal 502. See, Kumar, column 6, lines 37-60. Nothing in Kumar suggests generating instructions to a downstream terminal sent from a base station. Rather, in Kumar, power adjustment is calculated and performed within the wireless terminal 502 without any instructions from the base station 501. Thus, Kumar also does not affect the patentability of claim 16. Accordingly, it is respectfully submitted that claim 16 is patentable over Leano and Kumar in this regard, too.

The Examiner states that it is notoriously well known to control the power by sampling a plurality of recent power measurements in various sections in the Office Action. Applicants have no means to confirm the accuracy of these statements. If the Examiner is relying on this supposed "notoriously well known" principle, Applicants respectfully request that he cite a relevant reference so that Applicants can assess the patentability of the pending claims.

Regarding the Official Notice taken with respect to claims 24 and 26, Applicants respectfully request that the Examiner provide references teaching the relevant features since only with such references in hand can Applicants make a meaningful assessment of whether the prior art teaching of such features can be properly combined with other prior art relevant to the claims.

IV.   NEW CLAIMS 36-42

Claims 36-40, which are dependent from independent claims 1, 11, 24, 27, and 32, respectively, have been added. Claims 36-40 require "sending instructions from the headend to the cable modem." Those instructions pertain to adjustments calculated from a plurality of measurements. For at least the reasons set forth above in connection with claim 16, Leano and Kumar cannot be said to teach or suggest the claimed feature of claims 36-40. Thus, claims 36-40 are believed to be patentable over the cited art.

Claims 41 and 42 correspond to claims 1 and 11, respectively. Thus, claims 41 and 42 are believed to be allowable for at least the same reasons set forth in connection with claims 1 and 11.

V.   CONCLUSION

Applicants believe that all pending claims are in condition for allowance, and respectfully request a Notice of Allowance at an early date. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 510-843-6200.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP

Haruo Yawata
Limited Recognition under 37 CFR §10.9(b)

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APPENDIX -- VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Paragraph beginning at page 2, line 4 has been amended as follows:

The main distribution component of HFC cable system 101 is a hub 102 (also referred to as the "head-end") which can typically service about 40,000 subscribers or end-users. Hub 102 contains several components, most notably CMTS 104. From CMTS 104, separate downstream and upstream lines are used for sending and receiving data. Downstream signals pass through an upconverter 123 and onto other components on their way to destination cable modems. Upconverter 123 converts the frequency at which downstream signals are carried. All data from CMTS 104 is carried in an "intermediate frequency" that is independent of both channel and service. Upconverter 123 coverts intermediate frequency signals channel specific radio frequency signals. The downstream RF signals are broadcast over the cable plant and ultimately received at the cable modems. This figure shows cable modems as blocks 105, 106, 107A-C, 108, 109, [110,] 111, 112, and 113. The components on the downstream path between upconverter 123 and the cable modems are not depicted.

IN THE CLAIMS:

Claims 15 and 35 have been amended as follows:

15. (Amended)   The method of claim 11, further comprising:

after instructing the cable modem to adjust its power, determining that the upstream signals from the cable modem [now] contain less than the threshold level of noise or fluctuation; and

returning to the first technique for adjusting the cable modem power.

35. (Amended)   The computer program product of claim 32, further comprising program instructions for:

after instructing the cable modem to adjust its power, determining that the upstream signals from the cable modem [now] contain less than the threshold level of noise or fluctuation; and

returning to the first technique for adjusting the cable modem power.

Claims 36-42 have been added as follows:

36. (New)   The method of claim 1, wherein instructing the cable modem to adjust its power comprises sending instructions from the headend to the cable modem.

37. (New)   The method of claim 11, further comprising sending instructions from the headend to the cable modem to adjust the cable modem power by amount determined using the second technique.

38. (New)   The method of claim 24, wherein instructing the cable modem to adjust its frequency comprises sending instructions from the headend to the cable modem.

39. (New)   The computer program product of claim 27, wherein instructions for instructing the cable modem to adjust its power comprises instructions for sending instructions from the headend to the cable modem.

40. (New)   The computer program product of claim 32, wherein the program instructions further comprise instructions for sending instructions from the headend to the cable modem to adjust the cable modem power by amount determined using the second technique.

41. (New)   Apparatus for adjusting the power of a cable modem on a cable network, the apparatus comprising:

(a)   means for determining that cable modem signals received at or proximate a head-end of the cable network fluctuate in power by more than a defined amount;

(b)   means for calculating a power adjustment using a plurality of recent power measurements of signals from the cable modem taken at or proximate the head-end of the cable network; and
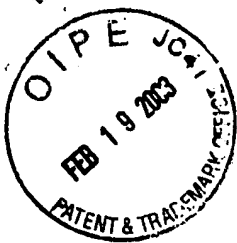
(c)   means for instructing the cable modem to adjust its power based upon the calculated power adjustment.

42. (New)   Apparatus for controlling the power at which a cable modem sends data upstream on a cable network, wherein at or proximate a cable network head-end, the cable network periodically determines the power of upstream signals from the cable modem, the apparatus comprising:

(a)   means for adjusting the cable modem power based on a first technique;

(b)   means for determining that upstream signals from the cable modem contain more than a threshold level of noise or fluctuation; and

(c)   means for adjusting the cable modem power based upon a second technique that averages recent cable modem power measurements.
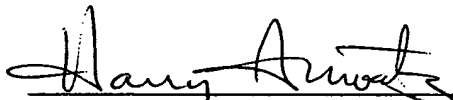
BEFORE THE OFFICE OF ENROLLMENT AND DISCIPLINE
UNITED STATE PATENT AND TRADEMARK OFFICE

LIMITED RECOGNITION UNDER 37 CFR § 10.9(b)

Mr. Haruo Yawata is hereby given limited recognition under 37 CFR §10.9(b) as an employee of Beyer Weaver & Thomas, LLP. to prepare and prosecute patent applications wherein the patent applicant is the client of Beyer Weaver & Thomas, LLP., and the attorney or agent of record in the applications is a registered practitioner who is a member of Beyer Weaver & Thomas, LLP. This limited recognition shall expire on the date appearing below, or when whichever of the following events first occurs prior to the date appearing below: (i) Mr. Haruo Yawata ceases to lawfully reside in the United States, (ii) Mr. Haruo Yawata's employment with Beyer Weaver & Thomas, LLP. ceases or is terminated, or (iii) Mr. Haruo Yawata ceases to remain or reside in the United States on an H-1B1 visa.

This document constitutes proof of such recognition. The original of this document is on file in the Office of Enrollment and Discipline of the U.S. Patent and Trademark Office.

Expires: November 6, 2003

Harry Moatz,
Director of Enrollment and Discipline